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Hayfork Project:

This project has been worked for three consecutive years. The infestation was very heavy and the area very large. Owing to a lack of funds only a part of the area could be worked each year. The periods of work have been as follows:

Work began on November 11, 1912 and closed April 30, 1913, during which time 1553 trees were treated on an area of 45,500 acres.

The next season control work was reuumed, covering the period Feb. 11, 1914, to May 1, 1914, including the recleaning of the 1912-13 area and additional area of 23,940 acres, making a total of 69,440 acres on which 1,046 trees were treated.

The control work of the present season began March 8, 1915 and closed May 1, 1915, during which time 531 trees were treated on 40,780 acres.

The control work of the present season began March 8, 1915, and closed May 1, 1915, during which time 531 trees were treated on 40,780 acres.

The total number of trees treated for the three seasons is 31,130.

The infestation this year seems to be considerably less on the valley floor than last year, especially the flathead borers, but on the slopes the infestation was a good deal heavier, 531 trees being treated this year to 350 trees on the same area last year. This heavy infestation seems to be due to the large number of last year windfalls which occurred on the slopes and ridges above the valley floor. Recent investigations in the Lassen National Forest have also shown that windfalls cause a very large amount of infestation. Again, the outbreak on the Sierra of Ips confusus, which destroyed much young growth, was undoubtedly caused by snow break. Near the windfalls on the Hayfork Project, several groups of small trees, ranging from 5 to 175 in number, were infested with Ips confusus. These trees were of small diamter and, though treated, were not included in the 531 trees above mentioned.

The area of this project has not been entirely covered. Some of the best commercial timber has not as yet been worked. It is felt that from a broad standpoint 75% of the infestation has not yet been controlled. These deductions have been made from this year's report as an inspection of the area hasnot yet been made, but is planned for the first part of Sept. 1915. Conditionally, therefore, I am recommending an allotment of $2,000.00. Although this area is not accessible at present, as a matter of policy it would seem best to continue the work until the infestation is controlled. Many residents look upon this area as an experimental in control work, and, while they realize that the infestation has lessened in a large part of the area, they are also aware that the infestation is still considerable and that some portions of the best timber are still heavily infested. This is especially so on the unworked parts of the area.

Recommended allotment: $2,000.00

Summary:

Stand of timber protected	362,490,000 ft.
Value of timber protected	$306,225.00
Total number of acres	84,300
Number of sections	132
Total number of infested trees worked	3,130
Cost of protection, 1913	$3,517.80
" " " 1914	2,872.17
" " " 1915	1,963.61

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RALPH HOPPING.

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Trinity
Insect Control

WORKING PLAN FOR HAYFORK PROJECT.

Review of past work:

1. Date of work. Actual control operations on this project were started three years ago and have been carried on during the past three winters as follows:

November 11, 1912, to April 30, 1913.
February 11, 1914, to May 1, 1914.
March 8, 1915, to May 1, 1915.

2. The species of insects killing the trees are D. brevicomis, D. monticolae, Ips confusus, Melanophila gentilis and D. valens. D. brevicomis is by far the most serious of these species in this infestation.

3. Number of trees felled:

	Yellow Pine	Sugar Pine	Jeffrey Pine	Total
1912-13	1,526	27	--	1,553
1914	988	58	--	1,046
1915	461	61	9	531
Total	2,975	146	9	3,130

4. Average diameter by species:

1912-13 20.1 inches (no figures separately by species)

	Yellow Pine	Sugar Pine	Jeffrey Pine
1914	16	38.6	--
1915	21.5	37.6	24.4

5. Average cost:

	Per tree:	Per M.B.M.
1912-13	$2.26	2.40
1914	2.75	3.18
1915	3.67	2.93

6. Total expended to date:

		vol.
1912-13	$3,517.80	1,464,650
1914	2,872.17	903,000
1915	1,963.61	669,300
Total	$ 8,353.58	132,180
1916	650.73	

Time of work and working period:

The work should be done during the favorable weather of late winter and early spring, in the months of February, March and April. Fall weather, after the close of a late fire season, is usually too uncertain and stormy for advantageous work and in addition the infested trees are more difficult to spot in the fall as the foliage very frequently remains green until late winter or spring.

Just when the work should start will depend upon the climatic variations of the season.

February is sometimes a more favorable month than March in which to work, while again the depth of the snow may preclude work in February. The work, however, should be completed by May 1, for by that time some of the beetles are emerging, and in addition the fire risk necessitates more care and expense in burning the bark and branches.

It is estimated that the work next spring will require at least 560-man days.

Accessibility of area:

From a milling standpoint, the timber within the Hayfork watershed is inaccessible at present on any large scale, having no railraod, and poor roads for any extensive hauling or trucking of lumber. The nearest railroad points are approximately 70 miles distant bywagon road.

Inasmuch as control work has been carried out on an extensive scale in this watershed during the past three years, but the funds available have never been sufficient to embrace the whole area or permit of a satisfactory cleaning, it would be unwise to abandon the project because of inaccessibility without bringing the control work to a logical and satisfactory conclusion. A further reason for this is the effect upon public opinion. We have been pointing to this control work in an educational way to correct the false ideas of the public with regard to the nature of insect infestation and the popular impression as to the beneficial effect of light burning in relation thereto, and we need at least one season's further work to demonstrate clearly to the public the lasting beneficial effects of our previous work.

From the standpoint of accessibility for insect control work, this area is readily accessible by road and trails.

General plan of work:

The 1916 work should embrace all portions, of Tule, Summit and Duncan Creek drainages which have not yet been covered, with a recleaning of all area previously worked where groups of infested trees occur or large trees show up containing large broods. Our work should be sufficiently intensive to clean up 80% of the infestation. Isolated trees of small diameter, or trees only lightly infested, should not be spotted or worked. The valley floor will be eliminated from the work the same as last year.

Organization:

The organization should in general follow last year's plan.

Officer in Charge. Ivan A. Cuff of Peanut (Assistant Ranger on furlough) has proved exceedingly efficient at this work in the past and should be the officer in direct charge of the work, if he is available at that time, under the general supervision of Deputy Supervisor W.D.Coffman.

Statutory men. Only five statuotry rangers are attached to the Trinity Forest during the winter months. Of these five, Ranger Graham is subject to detail elsewhere during the winter months, or if left here, will be needed during as much of the winter as possible in the compilation of land classification data. With our force reduced so materially during the winter months there will be sufficient current work to keep the other four district rangers pretty busy so that at best it would hardly be possible to detail more than one of them at any one time to insect control work.

In case statutory men from other forests were assigned to the Trinity for this work, it would require at least nine men for a period of sixty

actual working days to accomplish this control work. Both the travel and subsistence expenses of all statutory rangers assigned to this work would have to be provided for by funds outside the Trinity's present allotment, since our allotment is inadequate to cover any of these expenses. If a crew of statutory men were assembled from other Forests for this work, their travel expenses, together with salary and board over stormy periods, would make the cost of such an arrangement far in excess of the hiring of local temporary laborers.

I would recommend that unless money is available to complete this control work in a thorough and satifactory manner, that it be allowed to wait until next year rather than to attempt it with an inadequate crew resulting in a partial clean up insufficient to give us tangible results.

Temporary men. If a special allotment of $2000 can be provided for this work, our plan should be to employ temporary laborers in Hayfork Valley, who havd had previous experience in insect control work and who can be laid off without embarrassment during stormy weather because they can go to their homes until work starts up again.

The crew organization will be similar to last year, i.e., "flying" crews of three men each who can cook for themselves.

Pack animals needed. Pack animals and wagon transportation can be hired locally as needed. This will be much cheaper than to have the various crews keep pack animals with them.

Proposed wages:

The wages should be the same as we have been paying our insect control crews in the past: namely: for men in camps $2.00 per day and board for days worked, and subsistence only on Sundays or occasional stormy days on which no work is performed. In case of protracted storm the crews are laid off and the men return to their homes and provide their onw board.

To those men who work from their homes and board themselves, the wages are $3.00 per day. These men receive nothing for Sundays and stormy days on which no work is performed.

Proposed camps:

Certain parts of the area can be worked conveniently from ranch houses, as, for instance, Salt Creek, Lower Tule Creek, Drinkwater Gulch and perhaps portions of Summit Creek and Duncan Gulch. In that case, the men can either board at home, where they are conveniently located to their work, or else arrangements can probably be made as in the past to board them at a convenient ranch house at $1.00 per day.

For those men who camp out there is during the spring an abundance of good water so that there are many camping sites available concenient to the work in each watershed tributary to the Hayfork Control Unit. With three men crews the outfits can beconveniently moved at short intervals to keep the men close to their work.

Progress reports:

Inasmuch as the work will be along the same lines as in the past and in all probability under the direction of the same men who have heretofore conducted the work, I do not think detailed progress reports will be necessary. Brief reports to the District Office during the latter half of the work as to the amount of work accomplished, the sum expended and the amount of infestation still to be taken care of, should enable the District Office to make such adjustments of the insect control funds and balances as may be necessary.

J.D.COFFMAN
Deputy Forest Supervisor.

Approved: Nov. 24/15.

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Trinity - Studies.
Insect Control Hayfork, Project.

PROGRESS REPORT.

January 15, 1913.

The heavy snows in the Hayfork Valley which caused us to shut down the insect control work until probably the last part of February, give an opportunity for this report on the results so far accomplished.

Work was begun November 12, 1912, and, except for a few short interruptions by rain, was carried on until the evening of Jan. 7/13. During that time 741 trees, from 4" to 52" D.B.H., were treated with a cost for labor and subsistence (not including equipment, travel, and supervision) of $940. or $1.27 per tree. This work covered the area north of the Hayfork Creek between Big Creek and the Van Matre ranch up to the summit and also most of the area south of the Hayfork and east of the Salt Creek to the top of the ridge.

METHOD OF WORK.

Locating Infested trees.

Small watersheds of the infested area are taken as units. A "spotter", provided with a 4" scale sketch of the area and a pocket compass, makes the examination by zig-zaging along one slope of the watershed, locating and recording all infested trees. He keeps a note-book record of the number, D.B.H., species of insect, and color of foliage. He also puts in all the minor details of topography; shows the location of all infested trees by dots, and gives the number and diamter of the tree on the map. He blazes and numbers each tree at the base and on three sides. These blazes help the "fallers" greatly in locating trees, especially if the foliage is still green. Where the ridges are high and the slopes steep the spotter can cover the area by walking up and down the tops of the main ridges, going down into the canyon only occasionally, as most of the infestation is on the tops of ridges. The Canyons contain a large percentage of Douglas fir, and moisture and light conditions are not as favorable to the spread of insect infestation.

Some of the men in the crew have felt that each falling crew could do its own spotting but I think a spotter is quite essential for properly conducting the work.

Treatment of Infested Trees.

Crews of two men each are used. They are given a sketch map, showing totpography and all infested trees with number and diameter, for a particular unit or area. Each crew is equipped with a light "felling saw", two double-bit axes, one rake, two canteens, a file, a whet-stone, and at times, a light wedge which can be carried in the pocket. The light seven foot felling saws five or six inches in width are the best. They not only work better in the Yellow pine but are much easier to pack around the woods. After trying shovels, forks, and rakes for cleaning up the small pieces of bark we decided the rake was the best all around tool.

After falling the tree the crew lops the branches and piles the brush around the top of the trunk, care being taken to make the brush piles compact enough to insure burning. The balance of the bole and stump are then peeled and the bark strewn along the bole or thrown in small piles and burned. Each crew keeps a record of the number of the tree and the time spent in treating each tree. Aside from cost records this data is valuable

in keeping a line on what each crew accomplishes.

In case the trees have green foliage - damp enough to cause trouble in burning, we find it pasy to peel the the bark from most of the trunk, making a compact pile of bark and brush at the top of the tree which burns readily. Trees should rarely, if ever, be left to be burned at a later period.

The falling crews are instructed to watch closely for infested trees overlooked by the spotter. They have found about ten per cent of the total number treated, in this manner. A good percentage of these are green where the only evidences of infestation are pitch tubes or wood pecker markings and in some cases the needles seem to be twisted and do not radiate out from the stem as they do in healthy trees. Out of the 741 trees about 60 had green foliage.

On heavily infested areas like this a crew of tweleve men, aside from the one in charge is best; five falling crews, a spotter and a cook. Where the infestation is more scattering probably two or three, two-man crews would be more efficient and in some cases where the trees are very scattering two men could be given a small camping and falling outfit and put to work independently.

COSTS - WHOLE OPERATION.

1. Total cost of work from November 12, 1912 to January 7, 1913, inclusive, for labor and subsistence (not including equipment, travel, of rangers, and supervision)	$940.00
2. Total number of trees treated	741
3. Average cost per tree	1.37
4. Area covered - acres	11,560
5. Cost per acre	.08
6. Number of trees per section	41
7. Average diameter of trees	19.8 inches

Detailed time and cost figures were kept for 299 trees. For 75 of these separate time was kpet for(1) falling, (2) lopping and piling, (3) burning, (4) walking to tree. (The whole time spent each day in walking being proportionally distributed over the total number of trees cut for an eight hour day. The employees walk to work on government time and return on their own). For the balance of the trees only the time spent in (1) treating the tree and (2) walking, was kept.

The trees were divided into four diameter groups: (1) 4"-10" inclusive, (2) 12"-22", (3) 24"-34", and (4) 36" and over. An allowance of 10 bd. ft. was made for 4-6" trees. Temporary labor cost $3.00 per day. Ranger labor $4.06 per day. "Hours per tree" is figured on a one man basis.

Average Figures on Trees Where Records Were Kept.

299 trees.
19.8"D.B.H.
705 bd. ft.
48 min. spent in walking to tree.
2 hrs. 30 min. spent in treating tree.
$1.32 cost of treating tree.
1.87 " per M. Bd. Ft.

Trees Where Separate Time to Fall, Lop and Pile, and Burn, Was Kept.

Trees 4"-10" inc. D.B.H. Averages for 23 trees.
7.4" D.B.H.
20.4 Bd. ft.
35 min. walking.
17 " falling and lopping
18 " burning.
.52 cost per tree.
Trees 12"-22" inc. D.B.H. Averages for 20 trees.
15" D.B.H.
98 Bd. Ft.
28 min. walking.
15" falling.
69 " lopping and piling.
33 " burning.
.99 cost per tree.
Trees 24"-34" inc. D.B.H. Averages for 18 trees.
28" D.B.H.
978 Bd. Ft.
50 min. walking.
26 " falling.
2 hrs. 48 min. lopping and piling.
1 hur. 22 min. burning.
$2.37 cost per tree.
Trees 36" and over D.B.H. Averages for 14 trees.
39" D.B.H.
3091 Bd. Ft.
2 hurs. walking.
1 hur. falling
3 hrs. 19 min. lopping and piling.
1 hr. 26 min. burning.
$3.13 cost per tree.

Trees Where Only Total Time to Treat Tree Was Kept.

Trees 4" - 10" inc. D.B.H. Averages for 82 trees.
5.8 D.B.H.
18 Bd. Ft.
19 min. walking.
33 min. treating.
.35 cost per tree.
Trees 12" - 22" inc. D.B.H. Averages for 53 trees.
16,5"D.B.H.
171 Bd. Ft.
39 min. Walking.
1 hr. 40 min. treating.
.93 cost per tree.
Trees 24" - 34" inc. D.B.H. Averages for 63 trees.
28" D.B.H.
1103 Bd. Ft.
1. hr. 10 min. walking.
3 hrs. 48 min. treating.
$2.02 cost per tree.
Trees 36" and over D.B.H. Averages for 24 trees.

40" D.B.H.
3566 Bd. Ft.
1 hr. 42 min. walking.
5 hrs. 42 min. treating.
$2.93 cost per tree.

SUMMARY OF COSTS - 299 TREES.

Number	Class	Per cent of Total.	D.B.H.	Bd.Ft.
105	4-10"	35	6.6	19.2
75	12-22"	25	15.7	134.5
81	24-34"	27	28	1025.5
38	36" +	13	39	3328.5

Class	Walking	Treating	Total	Per Tree Cost	Per M Bd.Ft.Cost
4-10"	27 min.	34 min.	1 hr. 1 min.	.43	$22.39
12-22"	33.5 "	1 hr. 49 m.	2 hr. 22 "	.96	7.13
24-34"	60. "	4 hr. 12 m.	5 hrs.12 "	2.19	2.14
36" +	1 hr. 51 m.	5 hr. 43 m.	7 hrs.34 "	3.03	.91

(signed) G.M.EVANS
Forest Assistant.

Approved Jan 17/13.
W.A.Huestis.